

REMARKS

Applicant has extensively amended the specification to correct not only the informalities cited by the examiner but also others that makes the specification/disclosure more readily readable. In view of these amendments, Applicant requests that the objection to that disclosure be withdrawn and an action acknowledging same is respectfully requested.

Prior to addressing the new substantive rejections, Applicant would like to again clarify the present disclosure. Specifically, as stated in the first response, the system of the present disclosure is structured as follows: **With the exception of battery, all chips and circuits used in the system of the present disclosure are installed on a flexible circuit board, which is connected to a battery via two wires.** In particular, the system of the present disclosure includes: a CMOS camera installed on a flexible circuit board and connected to a DSP chip on the same flexible circuit board via conductors on this flexible circuit board. Image data from the CMOS camera are transmitted to the DSP chip via the conductors on the flexible circuit board. The DSP chip is connected to the wireless data emission chip also installed on the flexible circuit board via connection lines on the same flexible circuit board. Image data compressed by the DSP chip is sent to the wireless data emission chip via connection lines on the flexible circuit board. The wireless data emission chip moderates the data and emits the data via an antenna formed by the conductor printed on the flexible circuit board.

After installation of the CMOS camera, the DSP chip, and the wireless data emission chip on the flexible circuit board, the flexible circuit board is bent and shaped into a cylinder like configuration and connected to a battery via the two wires mentioned above. The system of the present disclosure is completed by wrapping a protective membrane on the exterior of the cylinder like configuration and the battery.

We now turn to substantive rejections. In the final rejection, the examiner objected to claims 35, 45, 46 and 50 as follows:

Claims **35, 45, 46, 50** objected to because of the following informalities:

Regarding claim 35, "the signal processing and transmitting device" (lines 14-15) should read —the *image* signal processing and transmitting device—.

Regarding claim 45, "an external controller compatible with corresponding controller" should read —an external controller compatible with *a* corresponding controller—.

Regarding claim **46**, "so that the controller intelligent capsule" should read —so that the controller *of the* intelligent capsule--.

Regarding claim **50**, "The capsule pattern endoscope of claim 35" should read —The capsule pattern endoscope of claim 49—.

Appropriate correction is required.

In response to the examiners objections, Applicant has amended each of the above claims to obviate the objection and an action acknowledging same is respectfully requested.

In the final rejection, Claims 41, 43, 44, 46, 48-51 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The examiner stated as follows:

Claim 41 depends on a canceled claim.

Claim 43 recites the limitation "the image compression processor". There is insufficient antecedent basis for this limitation in the claim.

Claim 44 recites the limitation "the microwave transceiver". There is insufficient antecedent basis for this limitation in the claim.

Claim **46** is unclear because the relationship between "sending microwave control commands" and "complet[ing] the commands received" is not apparent, and the limitation "the commands received" lacks antecedent basis.

Claim **48** recites the limitation "the camera chip, the DSP chip in the wireless emission chip". There is insufficient antecedent basis for this limitation in the claim.

Claims **49-51** recite the limitation "cylindrical like shaped". It is unclear what cylindrical *like* shaped is.

In response to the examiners rejections, Applicant has amended or canceled each rejected claim such that the rejections are obviated and action acknowledging same is respectfully requested.

In the final official action, the examiner rejected claims 35, 37-39, 42-48 under 35 USC 102 (e) as being anticipated by Takizawa et al. (US Pub. No. 2004/0176685 A1) (hereinafter as Takizawa et al.' 685) as follows:

Regarding claim 35, Figs. 1A-2 of Takizawa et al disclose a capsule pattern endoscope comprising:

an intelligent capsule (3) comprising: an outer shell having a front cover (22), a rear cover (i.e. main body 21) and a PCB structure (i.e. flexible printed circuit 32) operatively connected thereto; an image information acquiring device (i.e. lens 23 & image pick-up element 25) operatively positioned relative to the outer shell and comprising: an image sensor (25), operatively positioned within the outer shell; and a

lens optical system (23), operatively positioned within the outer shell and operatively connected to the image sensor; an image signal processing and transmitting device (i.e. communication circuit 28) operatively positioned within the outer shell; a light source (26), operatively positioned within the outer shell; a power source (29), operatively positioned within the outer shell and operatively connected to the image information acquiring device, the signal processing and transmitting device and the light source (all of these components inherently require power; see [0056]) and; an image receiving device (i.e. extracorporeal unit 5) operatively positioned relative to the intelligent capsule.

Regarding claim 37, Fig. 2 of Takizawa et al discloses that the image information acquiring device (23, 25), the image signal processing and transmitting device (28) and the light source (26) are assembled on a flexible circuit board (32) in an integrated manner wholly or partly (see [0056] where capsule components are "integrated" because they are combined into a single unit through physical and electrical connection).

Regarding claim 38, Fig. 2 of Takizawa et al discloses an image compression processor (i.e. processing circuit 27; see [0055]).

Regarding claim 39, Fig. 2 of Takizawa et al discloses a microwave transceiver (i.e. communication circuit 28) capable of sending compressed image data (see [0055]).

Regarding claim 42, Takizawa et al discloses a CMOS image sensor (see [0133]).

Regarding claim 43, Fig. 2 of Takizawa et al discloses that the image compression processor (27) comprises a CPU, DSP or ASIC processor (i.e. CPU 27a).

Regarding claim 44, Fig. 2 of Takizawa et al discloses a microwave communication chip (i.e. communication chip 28).

Regarding claim 45, Figs. 1A-2 of Takizawa et al disclose an external controller (i.e. extracorporeal unit 5) compatible with corresponding controller of the intelligent capsule (i.e. processing circuit 27).

Regarding claim 46, Takizawa et al discloses that the external controller (5) is capable of sending microwave control commands to the intelligent capsule (see [0055]) so that the controller intelligent capsule completes the commands received (processing circuit 27/CPU 27a controls capsule operations, which inherently are completed when performed).

Regarding claim 47, Fig. 2 of Takizawa et al discloses a flexible circuit board (32).

Regarding claim 48, Fig. 2 of Takizawa et al discloses that the camera chip (i.e. image pick-up element 25), the DSP chip (i.e. processing 27) in the wireless emission chip (i.e. communication 28) are operatively positioned on the flexible circuit board (32; Fig. 2 shows these components attached to flexible board 32).

Applicant has amended independent claim 35 to require, among other features, that all chip and circuits used in the system of the present disclosure, except for the battery, are installed on the flexible PCB structure, **including the antenna**. The examiner cites paragraph 0056 of

Takizawa et al. for the proposition that various components are assembled on a flexible circuit board in an integrated manner wholly or partly because they are combined into a single unit through physical and electrical connection. Applicant fails to see how this particular portion of the reference can be construed to meet the limitations of the new claims and that various components, except the battery, are operatively positioned on the flexible printed circuit board as this particular section states specifically that the flexible printed circuit board "is electrically connected to the image pick-up element 25, the processing circuit 27, the communication circuit 29, the battery 29, the buzzer circuit 30, and the switch 31." It is Applicant's position that this wording is insufficient to indicate that those elements are operatively positioned **on** the flexible printed circuit board. Further, even if one were to construe this particular portion as construed by the examiner, then the battery must also be construed to be operatively positioned **on** the flexible printed circuit board. As clearly required by the amended claims, the battery is not operatively positioned on the flexible printed circuit board but is merely connected by two wires thereto. In view thereof, Applicant respectfully submits that the rejections have been overcome by the amendments and an action acknowledging same is respectfully requested.

In the official action, the examiner rejected claims 40-41 under 35 USC 103 (a) as being unpatentable over Takizawa et al. in view of Gazdzinski as follows:

Claims **40-41**, are rejected under 35 U.S.C. 103(a) as being unpatentable over Takizawa et al (US 2004/0176685) in view of Gazdzinski (US Pub. No. 2001/0051766 A1).

Regarding claim **40**, it is noted that Takizawa et al does not disclose an image cutting device as required. However, Gazdzinski discloses image-cutting (i.e. windowing; see [0210]). It would have been obvious to one having ordinary skill in the art at the time of invention to modify the capsule endoscope of Takizawa et al with image windowing compression as taught by Gazdzinski as windowing results in smaller image sizes which reduces data transmission time and the amount of memory space required to store the image (see, e.g., Gazdzinski [0043]).

Regarding claim **41**, it is noted that Takizawa et al does not disclose the image compression rate adjusting as required. However, Gazdzinski discloses image compression rate adjusting (lines 16-25 of [0185] where PCM and DPCM require different compression rates, and an image compression rate adjusting device is inherently required to switch between the two compression methods). It would have been obvious to one having ordinary skill in the art at the time of invention to modify the capsule endoscope of Takizawa et al with the feature of the image compression rate adjusting as taught by Gazdzinski as pulse code modulation and delta pulse code modulation are conventionally used image data compression methods (see Gazdzinski

[0185]).

Applicant respectfully submits that the rejections have been overcome by the newly amended claims and an action acknowledging same is respectfully requested. Specifically, the newly amended claims have been drafted to consider the above applied primary and secondary references. Applicant has clearly delineated the various components of the disclosure in a clear and interconnected manner which Applicant submits is not shown in the applied references, particularly Takizawa et al. with respect to the specific components being operatively positioned on the flexible printed circuit board and the battery not being operatively positioned on the flexible printed circuit board and an action acknowledging same is respectfully requested.

In the official action, Claims 36, 49-50 were rejected under 35 U.S.C. 103(a) as being unpatentable over Takizawa et al. (US Pub. No. 2004/0176685 A1)(hereinafter as Takizawa et al'685) in view of Ichiro et al (JP 2001-091860), as follows:

Regarding claims **36, 49-51**, it is noted that Takizawa et al does not disclose antenna structure operatively positioned on the rear cover of the outer shell or a cylindrical-shaped circuit board. However, Figs. 3-5 of Ichiro et al disclose antenna structure operatively positioned on the rear cover of the outer shell and a cylindrical like shaped circuit board (i.e. flexible antenna 140, 141, when rolled up, is positioned on rear cover and is cylindrical-shaped), operatively connected to a power source (antenna is connected to a transceiver, which is connected to a power source) and operatively positioned inside the outer shell (antenna 140, 141 is placed in capsule). It would have been obvious to one having ordinary skill in the art at the time of invention to substitute the box-like antenna of Takizawa et al (33; Fig. 2) with the cylindrical-shaped antenna taught by Ichiro et al as the antenna of Ichiro saves space by lining the capsule body.

Applicant respectfully submits that the rejections have been obviated by the newly amended claims for the reasons given above and an action acknowledging same is respectfully requested. Specifically, all components including the antenna are operatively positioned on the flexible printed circuit board except for the battery.

CONCLUSION

Based on the preceding arguments, Applicant respectfully believes that all pending claims meet the acceptance criteria for allowance and therefore requests favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicant invites the Examiner to contact Applicant's representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account 19-0513.

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